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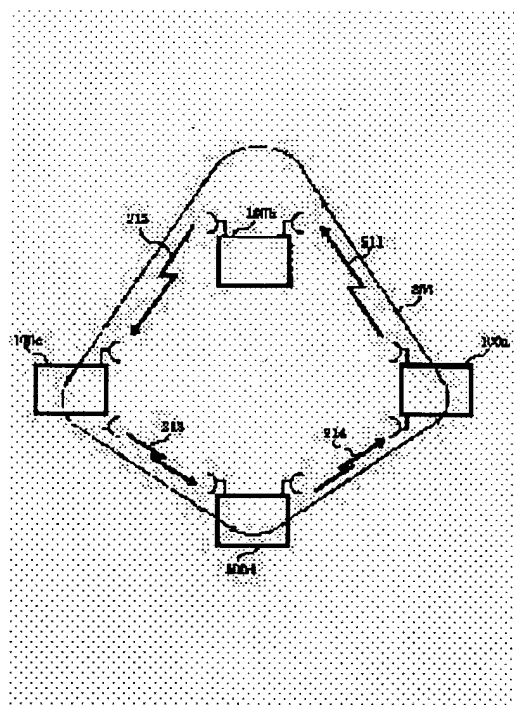
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(54) RADIO RING NETWORK SYSTEM

(57)Abstract:

PROBLEM TO BE SOLVED: To improve line quality and reduce interference noises in a network by reducing the number of unnecessary radio routes as much as possible.

SOLUTION: Respective node devices 100a, 100b, 100c and 100d are respectively provided with radio equipment capable of individually establishing bidirectional radio channels with the



facing node device. In the case of normal communication with no propagation path fault or the like, the respective node devices 100a, 100b, 100c and 100d respectively control the radio equipment of devices themselves so as to establish only radio channels 211, 212, 213 and 214. With this control, an active communication route 301 is established inside the ring and data sent from the node device 100a, for example, can be transmitted through the active communication route 301 in the order of node devices 100b, 100c, 100d and 100a.

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DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Field of the Invention] This invention relates to the amelioration for reducing the number of the wireless roots between each node equipment by said radio equipment, and reducing interference noise in detail, with respect to the wireless ring type network system which connects two or more node equipments in the shape of a ring through the radio equipment which can be formed for this every node equipment, and changes.

[0002]

[Description of the Prior Art] Drawing 5 is drawing showing the general configuration of this kind of wireless ring type network system. This network system connects two or more node equipments 100a, 100b, 100c, and 100d in the shape of a ring by the wireless circuit established by each [these] node equipments 100a, 100b, and 100c and the radio equipment which can be formed every 100d, and when each node equipments 100a, 100b, 100c, and 100d operate as a middle relay center within this ring, it communicates.

[0003] In this network system, each node equipments 100a, 100b, 100c, and 100d can establish a wireless circuit bidirectional between the node equipment which counters with the radio equipment of self-equipment, respectively.

[0004] Thereby, as the whole network, as shown in drawing 5, the bidirectional communication link root of the communication link root 301 of this drawing left-handed rotation which consists of the wireless circuit 211,212,213,214, and the communication link root 302 of this drawing right-handed rotation which consists of the wireless circuit 221,222,223,224 is formed in the node equipments 100a, 100b, and 100c and 100d.

[0005] here -- the communication link root 301 -- present -- it is used as the

communication link root of business, and the communication link root 302 is used as the spare communication link root. namely, the data from node equipment when the interruption section by propagation path failure, equipment failure, etc. has not occurred in ring 100a -- present -- business -- it is transmitted through the communication link root 301 in order of node equipment 100b->100c->100d->100a.

[0006] on the other hand, the node equipments 100d and 100a which adjoin during the above-mentioned communication link in this failure generating part 400 when a failure (x mark shows as a failure generating part 400) occurs in the propagation path between 100d of node equipment, and 100a, as shown in drawing 6 -- respectively -- present -- control of the loop back who turns up the communication link root 301 of business on the spare communication link root 302 is performed.

[0007] thereby, in node equipment 100a and 100d, the new communication link root (present -- business -- the loop back section of the communication link root 301 and the preliminary communication link root 302) which bypassed the above-mentioned failure generating part 400 is established, and the communication link for the node equipments 100a, 100b, and 100c and 100d is maintained through this detour communication link root.

[0008] in order [thus,] to secure the detour communication link root when the interruption section occurs in a ring by the propagation path failure, equipment failure, etc. in this kind of conventional network system -- every node equipment -- the radio equipment of self-equipment -- present -- business -- it was common that the bidirectional wireless root corresponding to the communication link root and the preliminary communication link root controlled possible [attendance].

[0009] For this reason, when the interruption section has not occurred in a ring, wireless transmission will always be performed also about the preliminary communication link root without the need, the number of the wireless roots of that part will increase, and the interference noise in a network will increase.

[0010]

[Problem(s) to be Solved by the Invention] thus -- the above-mentioned conventional wireless ring type network system -- present -- business -- since the radio equipment of self-equipment was controlled for every node equipment to be able to carry out the attendance of the bidirectional wireless root corresponding to the communication link root and the preliminary communication link root, network interference noise increased and only the

part with much wireless root had a trouble of making circuit quality deteriorate.

[0011] This invention cancels the above-mentioned trouble, and the interference noise in a network is reduced by reducing the unnecessary wireless roots as much as possible, and it aims at offering the wireless ring type network system which can raise circuit quality.

[0012]

[Means for Solving the Problem] In order to attain the above-mentioned purpose, invention of claim 1 In the wireless ring type network system which connects two or more node equipments in the shape of a ring through the radio equipment which can be formed for this every node equipment, and changes said node equipment It is characterized by establishing the wireless root of an one direction and performing the communication link in a ring between the node equipment which possesses the control means which controls said radio equipment that the bidirectional wireless root should be established according to an individual, respectively, and usually counters between the node equipment which counters at the time [equipment].

[0013] Invention of claim 2 is set to invention of claim 1. Node equipment A failure detection means to detect generating of the failure by communication link interruption, and a notice means to notify the detection result of this failure detection means to all the node equipments in a ring are provided. Said control means In addition to said already established wireless root, by recognizing that the failure occurred in the ring based on the notice from said notice means, it is characterized by controlling said radio equipment that the wireless root of hard flow should be established with this wireless root.

[0014] It is characterized by performing loop back control with which invention of claim 3 connects by return [between / said bidirectional wireless roots] by recognizing it as self-equipment adjoining the failure generating part based on the notice from said notice means in invention of claim 2, as for a control means.

[0015]

[Embodiment of the Invention] Hereafter, the gestalt of operation of this invention is explained to a detail with reference to an accompanying drawing. Drawing 1 is drawing in the wireless ring type network system concerning this invention usually showing the example of a setting of the communication link root. This network system connects two or more distributed node equipments 100a, 100b, 100c, and 100d in the shape of a ring by the wireless circuit established by each [these] node equipments 100a, 100b, and 100c and the

radio equipment which can be formed every 100d, and is constituted.

[0016] Although the radio equipment formed in each node equipments 100a, 100b, 100c, and 100d can establish a wireless circuit bidirectional between the node equipment which counters, respectively especially -- this invention -- setting -- present -- business -- the wireless circuit corresponding to the communication link root 301 -- this -- present -- business -- the communication link root 301 is realized by the functional configuration establishable according to an individual, respectively in the wireless circuit corresponding to the preliminary communication link root (preliminary communication link root 302 mentioned later) of hard flow.

[0017] And in the communication link at the time of usual [which is shown in drawing 1], each node equipments 100a, 100b, 100c, and 100d control the radio equipment of self-equipment by the network system of this invention, respectively so that only the wireless circuit 211,212,213,214 is established. this control -- the inside of a ring -- present -- business -- the data which the communication link root 301 was secured, for example, were sent from node equipment 100a -- this -- present -- business -- it can transmit through the communication link root 301 in order of node equipment 100b->100c->100d->100a.

[0018] When this failure that lapses into communication link interruption, such as a wireless propagation path failure or radio equipment failure, in a ring usually occurs during the communication link at the time, in this network system, control for securing the detour communication link root which bypasses the failure generating part concerned is performed.

[0019] Drawing 2 shows the situation shown in drawing 1 when a propagation path failure (x mark shows as a failure generating part 400) usually occurs between 100d of node equipment, and 100a during the communication link at the time. Node equipment 100a located in the downstream of the failure generating part 400 detects that the failure occurred between 100d of node equipment by recognizing that the wireless reception output from 100d of node equipment of the upstream broke off at the time of generating of a failure as shown in this drawing.

[0020] moreover, in this node equipment 100a, it was used until now, after detecting the above-mentioned failure generating -- present -- business -- the notice information of a failure which shows that the failure in the failure generating part 400 occurred is notified to each node equipments 100b, 100c, and 100d of the downstream through the communication link root 301.

[0021] henceforth, the node equipments 100b, 100c, and 100d were

established by receiving the above-mentioned notice information of a failure until now -- present -- business -- the wireless circuit corresponding to the communication link root -- in addition, with this, control for securing the detour communication link root is further performed by establishing the wireless circuit corresponding to the preliminary communication link root of hard flow.

[0022] Drawing 3 is drawing showing the example of a setting of the detour communication link root after failure generating in drawing 2 . in this drawing, the node equipments 100b and 100c were used until now by receiving the above-mentioned notice information of a failure sent from node equipment 100a which detected the failure -- present -- business -- the wireless circuit 212,213 corresponding to the communication link root 301 -- in addition -- this -- present -- business -- the radio equipment of self-equipment controls, respectively that the wireless circuit 224,223 corresponding to the preliminary communication link root 302 of hard flow in the communication link root 301 should be established.

[0023] moreover, with 100d of node equipment contiguous to the failure generating part 400 By receiving the above-mentioned notice information of a failure sent from node equipment 100a it was used until now -- present -- business -- the wireless circuit 214 corresponding to the communication link root 301 -- in addition -- this -- present -- business, while controlling the radio equipment of self-equipment that the wireless circuit 222 corresponding to the preliminary communication link root 302 of hard flow in the communication link root 301 should be established it was used till then -- present -- business - - on the preliminary communication link root 302 newly secured in the communication link root 301, the loop back within self-equipment is controlled by return .

[0024] furthermore, also in node equipment 100a which detected failure generating, it was used until now, after detecting this failure generating -- present -- business -- the communication link root 301 -- the data reception from the preliminary communication link root 302 of hard flow -- it should be coped with -- the inside of self-equipment -- present -- business -- the loop back who turns up the preliminary communication link root 302 to the communication link root 301 is controlled.

[0025] the node equipments 100d and 100a which adjoin this failure generating part 400 with this network system by the above control at the time of generating of the failure in the failure generating part 400 -- present -- business -- the detour communication link root where the communication link

root 301 was turned up by the preliminary communication link root 302 is secured.

[0026] Henceforth, the data sent out from node equipment 100a present -- business, after sequential transmission is carried out with node equipment 100b->100c->100d through the communication link root 301

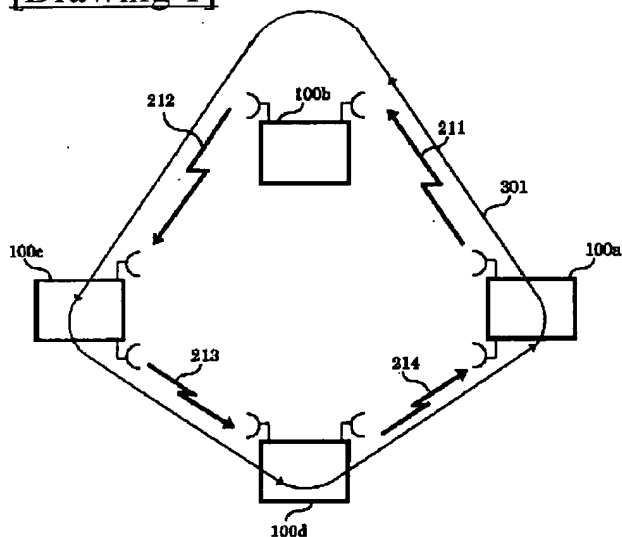
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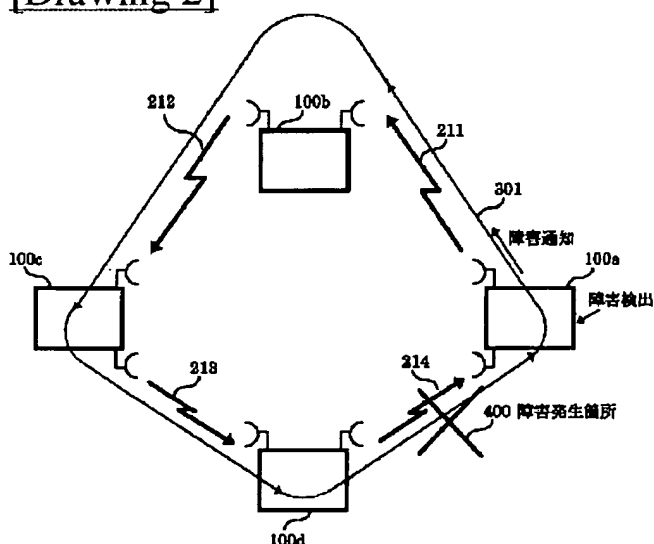
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DRAWINGS

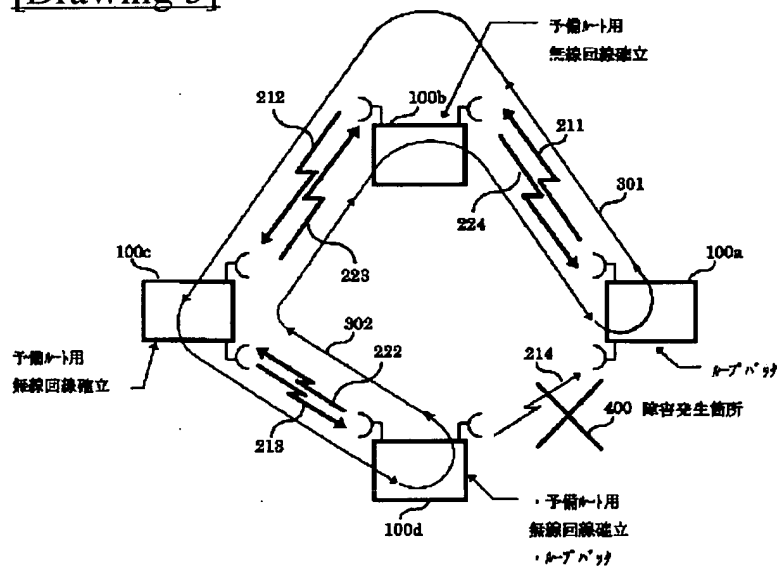
[Drawing 1]



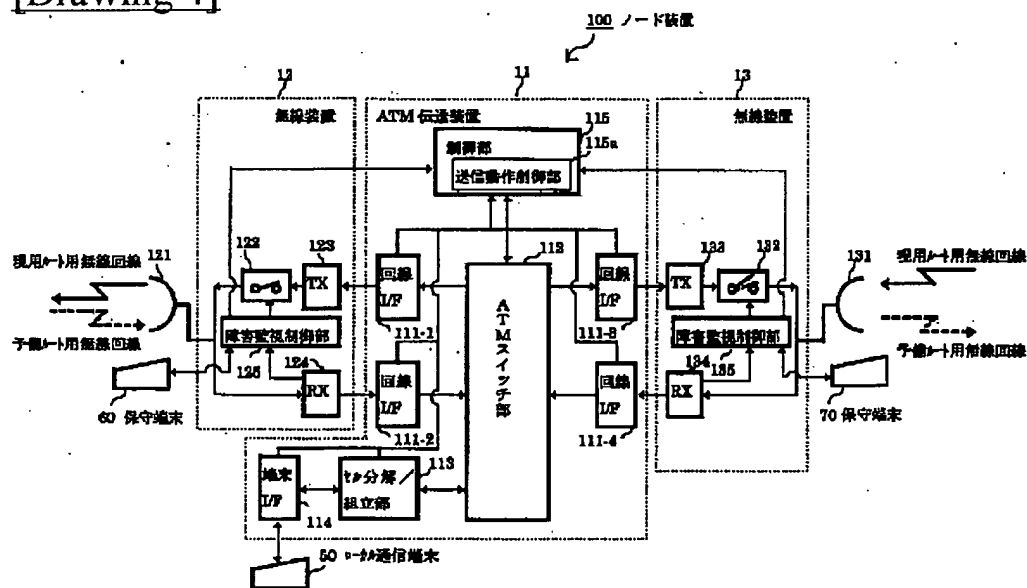
[Drawing 2]



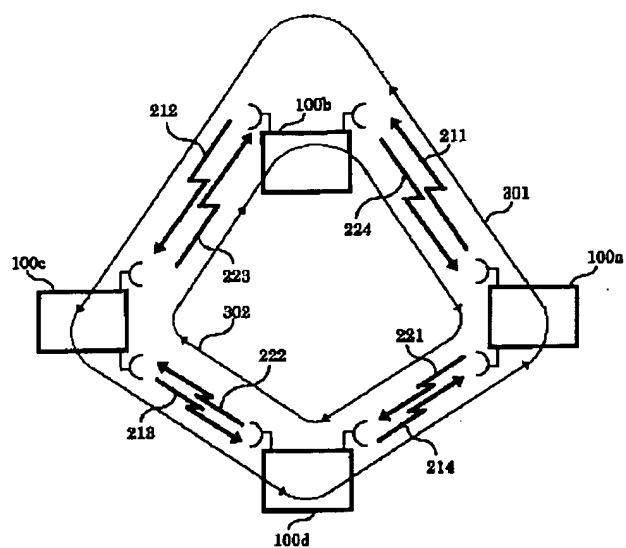
[Drawing 3]



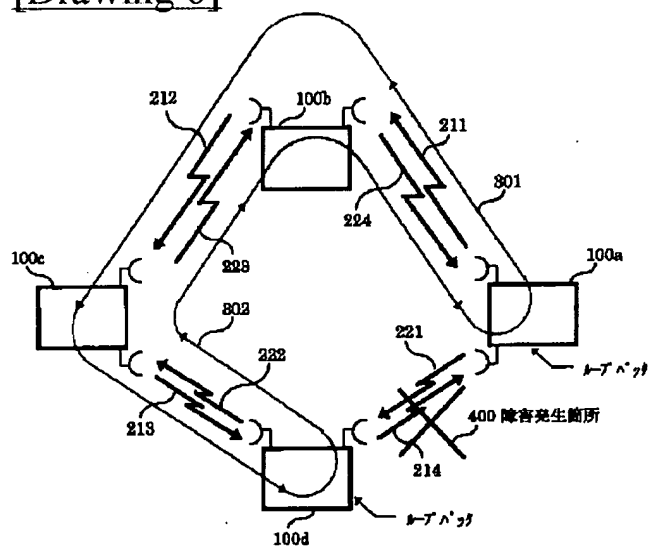
[Drawing 4]



[Drawing 5]



[Drawing 6]



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